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AUTHOR Fort, Inza L.; Di Brezzo, Ro
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ABSTRACT

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Nutritional Strategies for Women Participating in Competitive/Recreational Sports

Inza L. Fort, Ed.D.

Ro Di Brezzo, Ph.D.

Human Performance Lab

University of Arkansas

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Abstract

The preponderance of articles and research on nutrition can be confusing. The active woman over 30 can enhance performance and health with a high-quality diet. Specific nutritional concerns for women after the college years, such as nutrient content, iron, calcium, vitamin supplementation, and caffeine are discussed. Evidence that processed foods and fast foods contain high percentages of fat are presented. Training and nutritional patterns of 47 women who participated in 1/4, 1/2, or the full Hogeye Marathon (Arkansas) indicated that most of these women exercised an average of 20+ miles per week and consumed an average of 1900 calories daily. Few, because they were regular exercisers, were overly concerned about their weight. Results indicated that most of the surveyed women consumed quality diets designed to enhance their performance.

Nutritional Strategies for Women Participating in Competitive/Recreational Sports

Did you notice this week (April 17-23, 1989) that the Ford Motor Company was celebrating the 25th anniversary of the Mustang? If you remember or were born when the Mustang came upon the scene then you have some different nutritional concerns than those who came along after the Mustang. Our bodies begin to respond in different ways physiologically after the mid-twenties. So, in keeping with our theme of the Restoration of the '65 Mustang, let's look at how this classic needs tuning from a nutritional standpoint for maximum performance, whether it be a Sunday drive or the most important rally of the year.

I admit to being a voracious reader of newspapers and magazines, always clipping articles, thinking, "That's really interesting . . " or, "I can use that information in my classes, as a lead to some other information in my research, or for a speaking presentation." I just want to share with you some of the headlines that have I've noticed during the last year or so just regarding nutrition, and especially nutrition for adults and, even more specifically, for women:

"AVOID IRON UNLESS IT'S PRESCRIBED"

"WOMEN EATING SMALLER, BETTER DIETS"

"SPINAL BONE LOSS IN WOMEN"

"CALCIUM PILLS WORK, STUDY SAYS"

"OAT BRAN AIDS FIGHT ON BLOOD FAT"

"WE THINK FIT -- BUT ACT FLABBY"

"THE BIG FLAP OVER FISH OIL"

"THE CONFUSION OVER CALCIUM"

"WOMEN'S ATTEMPTS TO CUT OUT FAT LEAVE THEM SHORT ON MINERALS"

"FAT REGAINED IS DOUBLE TROUBLE"

"THE TRUTH ABOUT CALCIUM"

Actually, these don't even begin to cover my file of clippings. Nutrition is a hot topic! If you don't believe that, take the time to look up how often books relating to nutrition make the best-seller lists. Exercise Physiology tells us that peak physiological function occurs between the ages of 20 and 30. After that, most factors decline at a rate of about 3/4 to 1% a year. There is a decline in max VO2, muscle strength and power, flexibility, and an increase in body fat. Kind of depressing, isn't it?

Well, the good news is that it doesn't have to be that way. A colleague and I were talking recently and this is the year we both happen to celebrate Jack Benny's birthday.

Well, I've decided I'm not going to be one of those people who are "forever 39" and "over the hill". I'm going to be one of those who takes a more positive outlook -- "You're not getting older kid, you're getting better" and "Life begins at 40" because the healthy people and the young at heart are, indeed, forever young.

So, I have been in my re-evaluation process and am now in my restoration process. A lot depends on the exercise we do and the kinds of food we eat. Body composition for females may evolve from 20-25% fat in the college years to 39% fat at age 60. These figures are highly variable, but increases in body fat are much less in trained individuals. And even nicer is that, throughout life -- even as elderly, we are quite trainable from a physiological point of view and we can do marvelous things for ourselves from a nutrional point of view.

Every year in Fayetteville, Arkansas we have the Hogeye Marathon. In fact, it was held yesterday and participants can register to run the entire marathon or run half in a 2-person team or 1/4 in a 4-person team. It's called Hogeye not because we're the Arkansas Razorbacks, but because the participants run out to a little town named Hogeye and back. Fayetteville is located in the hills of the Ozarks, and I can tell you from having participated in part of it before, it's

a quite strenuous run. Last year, we wanted to survey the women over college age that particpated in a least a quarter of the marathon. Our questionnaire related to training and nutritional patterns. I would like to relate some of the things we found out about training habits and nutritonal patterns from these active women.

Our sample consisted of 47 women with an average age of 33. We included women over the college age and our oldest

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Insert Table 1 about here

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participant was 51. These were women who averaged just over 6 years of running with a mean weekly mileage of a little over 20 miles per week. Most of these women trained between 4 and 5 days per week with an average workout between 4 and 5 miles. We were interested in knowing "How important is weight to you?" Although only a third considered their current weight their desired weight, over 90% said weight was "not very important" or "not important" to them. Eighty-five percent of the two-thirds that were not at their ideal weight said that the difference between their current weight and desired weight was 10 pounds or less.

Obviously, these women have a head start in growing old gracefully. Research tells us that exercise of a certain instensity and duration is the single most important factor in controlling body fat. Well, I want to focus on another important factor in controlling body fat and that is the intake of food and nutrients. We asked our women, "Do you count calories?" Two-thirds said no. Then we asked these women to estimate their daily caloric intake. The mean value was over 1900 calories daily with only 2 respondents estimating as little as 1000 calories daily, while 15 percent were consuming over 2500 calories. One respondent estimated consuming as much as 4500 calories each day. This particular woman's weight was 128 and her maximum weight in her lifetime was 133. How many women do you know that could take in 4500 calories a day and not be concerned about weight? This woman averaged only 20 miles of running per week.

Research from Remington, Fisher, and Parent says that it's not how much you eat that counts but what you eat. A study at the University of Illinois in Chicago had interesting results. Two groups of mice were fed exactly the same number of calories for a 60-week period. One group ate regular rat chow (which happens to be low in fat and high in fiber) and the other group ate a diet similar to the typical

American diet -- same number of calories as the other mice, but at least 40% of the calories coming from fats and 25% from sugar. Despite the same caloric intake, carcass fat averaged 51% for the mice eating the "typical American diet" but only 30% for the mice eating regular rat chow. This lends evidence that weight and body fat control may be more than just calories consumed vs. calories burned.

The women in the Hogeye survey showed very little concern with counting calories even though most estimated they consumed more than the tables would tell you they needed to maintain their weight. An analysis of the foods these women ate most revealed a quite healthy diet -- lots of complex carbohydrates, low fat, and little sugar. Let me share with you some of their other nutritional patterns. Only 15% drank carbonated sodas and less than half drank diet sodas. Again, only 15% consumed alcohol except on very rare occasions and over half drank at least 3 or more glasses of water each day. Sixty-one percent drank between 1 and 3 glasses of milk per day.

We were also interested in knowing how these women perceived their knowledge of nutrition. Ninety-four percent perceived their knowledge as good while the remaining 6% felt their nutritional knowledge was fair. None thought their knowledge was poor. Then, we asked "How would you describe

your diet in terms of nutrition?" Fifty-five percent felt their diets were nutritionally good while 40% felt they were nutritionally fair and less than 5% said their diets were nutritionally poor. This certainly corresponds with the types of foods that most checked as consuming on a regular basis.

Seventy-eight percent of the women in our study ate at least three meals per day and three-fourth of them even snacked between meals. The combination of regular exercise, regular eating, and eating of nutritious foods seemed to account for a group that was not very concerned about weighing themselves and looking at the scales. In fact, well over half of our respondents weighed themselves, at the most, once a week and, usually, less often.

Our Hogeye women were asked if they prepared nutritionally for a competition. Seventy percent did not have a special diet the week of competition. Most of those that did loaded up on the carbos. A few others mentioned things like increasing water intake, eating fish and white meat, no alcohol, etc. When asked if they had a special diet the day before competition, 61% said yes. Almost all of these said the special diet consisted of high carbohydrates, like pasta. Two respondents said they actually decreased calories and one specifically avoided spicy foods. Finally,

we asked about a pre-competition meal. Only 36% ate differently before a race than otherwise. Examples of this meal consisted mainly of carbohydrate items -- toast, pancakes, cereal, pasta. A few preferred not to eat at all for a morning race. Several made sure that they took in extra water. About 10% had coffee.

Interesting enough, our sample of these women competing in a portion or all of the Hogeye race indicated a very healthy lifestyle. In fact, only two of the 47 reported ever having any eating disorders, such as binging and purging or regularly taking diet pills.

This lends credence to a topic I've referred to before -- "you are what you eat". We are finding more and more evidence every day that quality of food is a more important aspect of nutrition than quantity. Certainly, the active woman can take in far more calories than those who are inactive, but changing the composition of our diet may also yield some valuable dividends in health, both physically and emotionally. Various studies estimate the average American diet is anywhere from 40-50% fat. The American Heart Association recommends no more than 30% while the Pritikin people recommend as little as 10%.

Someone suggested recently to think about the supermarket that you shop in and see if most of the foods

that were good for you weren't located around the perimeter of the store and most of the processed foods were in the aisles. So, I got to thinking about the grocery stores that I use most often. And you know? They were right. If I wanted a high-quality diet -- fresh fruits and veggies, whole grain breads, and fresh poultry and fish, they were all located on the outside edges of the supermarket. The aisles were loaded with processed and canned foods, notoriously high in fat, sugar, and sodium. The exception was that the good cereals were mixed in with the junk cereals. So, I realized that with the exception of a few necessities like toilet paper and cat food, and if I wanted a highly nutritious diet, I never had to wander into the aisles. Go home and check your store out.

In many ways, this is a big change for me. Not being terribly proficient in the kitchen, the microwave and frozen processed foods have been like manna from heaven. So, if you are into processed foods for convenience or otherwise as I sometimes am, it certainly wouldn't hurt us to start reading labels. I am alarmed at the percentage of total calories that are fat in many of our processed foods -- and fast food is really a killer, which I have to admit is a terrible weakness of mine. Here's an example of what I found out when I started exploring this topic:

Food Item	Total Calories	% Fat	
Arby's			
Baked Potato, Super-stuffed Deluxe	648	53%	
(A plain baked potato)	90	1%	& no sugar
Beef 'n Cheddar	490	21%	
Chicken Salad Croissant	460	70%	
Burger King			
Whopper w/ Cheese	709	57%	
French Fries - Regular	227	52%	
Chicken Tenders - 6 pieces	204	44%	
Hardee's			
Bacon & Egg Biscuit	405	57%	
Ham 'n Cheese Sandwich	376	36%	
Big Cookie	278	50%	27% sugar
Kentucky Fried Chicken			
Drumstick - Extra Crispy	173	57%	
Drumstick - Original Recipe	147	54%	
Kentucky Nuggets - 6 pieces	276	57%	
McDonald's			
Big Mac	570	55%	
Apple Pie	253	51%	17% sugar
Chocolate Shake	383	21%	44% sugar
Wendy's			
Hamburger	350	46%	
Frosty - Small	400	32%	40% sugar
French Fries - Regular	280	45%	

- *The Fast-Food Guide*, 1986

So, even when total caloric count may be reasonable, a high percentage of fat won't help the waistline and that kind of diet may hinder exercise performance from a physiological standpoint. However, I do believe fast food chains are becoming more responsive to consumer concerns for healthier foods. Many are providing salad bars and changing to cholesterol-free cooking substances. Cholesterol-free doesn't necessarily mean total fat is reduced, but it is better for the heart and it's a start. Overall, there's still too much fat, but they are beginning to listen. When you go home, take a look at some of the things on your shelf and compare fat calories to total calories of a product. Fat contains approximately 9 calories per gram while proteins and

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Insert Table 2 about here

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carbohydrates contain only 4 calories per gram. Packaging lists the number of fat grams in the product. Take that number and multiply by 9 and then divide by the total calories. That's the percentage of fat. It was very sobering to discover some of my favorite "lean" and "lite" microwave dishes were over 40% fat:

Food Item	Total Calories	% Fat Calories
Weight Watchers		
Lasagna	340	37%
Pizza	330	27%
Chicken Enchiladas	360	44%
Turkey & Dressing	270	33%
Lean Cuisine		
Szechwan Beef	260	35%
Fish Florentine	240	34%
Salisbury Steak	270	43%

Sure, there's only 350 calories in the whole meal, but remember the mice eating the same number of fat calories verses the same number of carbohydrate calories.

Sugars and hidden sugars are also a problem. You can be deceived if you are looking just for the word "sugar". Sugars are also represented in foods as sucrose, sorbitol, dextrose, corn syrup solids (that's one you'll see quite often), etc. Health problems associated with too much sugar in the diet include headaches, sleep disturbances, depression, anxiety, irritability, fluctuating energy levels, arthritis, allergies, and various digestion and sugar

metabolism problems, just to mention a few. And, to say the least, there's quite a bit of controversy over health concerns from artificial sweetners, but that's another topic for another day. As you may know, labeling regulations require that ingredients on packages be listed in order of amount. Take a look at some of the things on your shelf and see how often sugar synonyms are listed.

So, a healthy breakfast should be primarily low fat and complex carbohydrates. When I go to the frozen waffle case, I discover that they range from 95-130 calories per waffle but approximately 30-40% of those calories are fat. The processing does this to foods. I like to zip by my favorite fast food place on the way to the office in the early morning for my favorite biscuit, but I was alarmed to discover over half the calories were fat. This will not improve my waistline! Therefore, I decided I needed to have a nice cereal for complex carbohydrates with skim milk for calcium, and so I started reading cereal boxes. I could find one cereal with a low amount of fat, but there was often too much sugar. Another cereal with low sugar had too much fat. Let me share with you a small sample of some cereals and some of their nutritional content:

Cereal	Calories	% Fat	% Sugar	Fiber Gms
Cap'n Crunch	120	15%	30%	?
Life	120	15%	20%	?
Cheerio's	110	16%	4%	2
Smurf Magic Berries	110	8%	51%	?
Honey Bunch of Oats	110	25%	22%	1
Grape Nuts	110	0	11%	2
Corn Flakes	100	0	8%	1
Fruit Loops	110	8%	47%	1
Honey Smacks	110	8%	55%	1
Rice Krispies	110	0	11%	?
Clusters	110	25%	25%	3
Fiber One	60	16%	0	13
Total	110	8%	11%	3
Bran News	100	0	27%	3
Shredded Wheat	90	0	0	3

So, start reading your boxes. I guess you heard about the rat study in which they gave one group of rats a diet of typical breakfast cereals and another group of rats a diet of the boxes in which the cereals came in. Guess which group wound up being healthier at the end of the study? The one which ate the cereal boxes. As I was in the grocery store

earlier this week, making sure I had accurate and up-to-date information, a mother was letting her 7-8 year-old child choose the cereal he wanted but she said that it couldn't have too much sugar. He would select a box and then together they would read the labels and figure out the sugar content. He put a few back, but soon both mother and child were happy with the final selection.

Basically, if you think about it, there is beauty in simplicity. The more natural the food, the more suited it is for our bodies. Processed foods are going to be higher in fat, sugar, and salt and often lower in nutrients because processing has taken out the natural vitamins and minerals and the manufacturers had to artificially put some back.

Just as frequency of training is important in exercise, frequency of meals eaten is an important variable in controlling body fat and overall health. With the stresses of careers, it is often easy to skip meals and either snack to make up for it or overdo it on the next meal. The active woman today needs at least three good meals per day. Those that eat more often of the high-nutrient foods will be less likely to gain weight than those who eat one or possibly two large meals per day. Snacking in response to genuine hunger is okay -- just make it healthy and not the vending machine/twinkie variety.

In the Melpomene Journal (Fall, 1988 issue), Joan Vogel wrote an article titled "Nutrition: Can It Give Athletes the Edge?" There certainly is evidence that an overall diet of high-nutrient foods can contribute to better health and there is evidence that certain nutritional practices may be desirable before a competitive event. Martina Navratilova had a book out a few years ago named Eat To Win. More and more athletes are espousing the advantages of combining nutritional strategies with training strategies, and discovering that training is enhanced by smart eating.

For the active woman participating in competititve and recreational sports, it is desirable that complex carbohydrates compose at least 60% of the total diet. Protein should be no more than 15% of total calories and fat should be no more than 25% maximum.

The next question that brings up is -- "If the quality of diet is good, is it necessary to take vitamin supplements?" Most of the vitamins and minerals needed by the active woman can be obtained through a high-quality diet, but according to Vogel, "Intense activity does increase the need for some vitamins and minerals which play a vital role in energy metabolism, reactions and contractions of muscle, and the transport of oxygen." Over half of the women in our

survey did take vitamin supplements. While vitamin and minerals are best obtained in the diet, it may be advisable to take certain supplementation. Vitamin C and the B-complex vitamins must be replenished daily. These are best found in fruits and veggies. Probably the two most important minerals the active woman needs to be sure she is consuming are adequate amounts of iron and calcium. Neither have high absorption rates and are lost through sweat and intestinal losses, along with the greater demands for total body hemoglobin that come with training.

Sports anemia may be an acute response to intense training. Iron itself is not absorbed well and the minimum daily requirement is 10 times what the body actually needs due to the very poor absorption rate.

Calcium is a particular concern for women as we age. If you have a family history of osteoporosis, adequate calcium intake in the teenage and young adult years is very important. As we get older, and especially after menopause, extra calcium as well as estrogen supplementation may be necessary. Two of the most important things we can do now to prevent osteoporosis is to consume a nutritional diet with adequate calcium and to participate in daily weight-bearing exercise. If you need calcium supplements, be aware that all

kinds are not equally absorbed. A 1200 mg calcium pill may have from as little as 9% up to 40% absorbable calcium.

Caffeine is also a topic much batted about in exercise physiology. Athletes have used caffeine before endurance events to take advantage of its so-called "glycogen sparing effects". But caffeine promotes the loss of other vital nutrients and fluid loss. It can generally be said that the negatives of caffeine outweigh the positives. Different people will react in different ways to caffeine. One-third of the women in our survey did not use caffeine at all and well over 60% drank less than two cups per day. One respondent did report drinking, on the average, 12 cups of coffee a day. Over half of those that did drink caffeine regularly experienced some withdrawal problems. "Caffeine is a strong insulin stimulator. This may be due to a direct insulin stimulation, or as a result of the high levels of sugar released into the blood when caffeine is ingested" (Remington, Fisher, and Parent, 1983). Thus, caffeine can cause irregular rises and falls in blood sugar.

In the latest issue of the journal from the Melpomene Institute for Women's Health Research (Winter, 1989), Jane Brody (health and science colunmist for the New York Times) talks about her career after college with its stresses and

using food as a comfort. By the way, did you realize that people often experience a significant weight gain within the first two years after college? Pretty soon, Brody had gained 40 pounds. That was 1965. She said she finally decided to quit worrying about her weight -- that her focus should be, instead, to take care of her body, to be healthy. Already active, Brody changed her eating to three healthy meals a day and one healthy snack -- no junk food and little salt or sugar. There were no missed meals because, she said, "If I let myself get hungry, I would lose control." As a result, she found she was eating a lot more food than before but it was healthy food with fewer calories. Well, you certainly know of her success today. She quit worrying about what the scale said. She is author of a best-selling and widely acclaimed nutrition book. The weight didn't come off all at once but over a couple of years. She is 47 today and says she has the energy of a person in their 20's. . . . . It seems as if the lesson for those of us who like food is that if you want quantities of food, you actually can eat a lot more if the nutritional quality is there.

You know, one definition of a classic can be that it gets better with age. Our topic is the restoration of the '65 Mustang -- if we take care of our machinery, fuel it

properly, and treat it with TLC, it becomes more valuable with age. I like to think that some of us are already classics and the rest of us are emerging classics. We are worth restoring so that our engines are humming. An important ingredient in the functioning of any car is high quality fuel. Have you noticed that the higher octane you use, the less the engine pings? Well, it's the same thing with this wonderful body of ours -- the higher the quality fuel we give ourselves, the better we are going to run, literally and figuratively.

Nancy Clark, a registered dietician, in an article entitled "Food For Thought" in Runner magazine says, "Food is more than fuel. It is energy, nourishment, health, and most certainly, enjoyment. Your food choices on a day-to-day basis build a foundation for well-being. Your muscles and body thrive on exercise and will become stronger and healthier if your feed them the optimal fuels."

We are being bombarded daily with new studies concerning health and manufacturers jump on the bandwagon and do an excellent job of marketing what they want you to believe. Just look at the recent preponderance of oat bran products. Ellen Goodman, a syndicated columnist for the Boston Globe, in an article this past year, wrote about the paradox of all the studies and research being reported. If I may quote a

few excerpts . . . "I think it has become impossible for Americans to keep their health IQ updated. We are all suffering from an information glut -- research overload. . . Sugar, we have been told, causes cavities, but saccharin may cause cancer and aspartame may cause you seizures. The sun apparently gives you Vitamin D and also wrinkles. Stay out of the summer rays and you get depressed, stay in and you get skin cancer. Coffee has been on and off the list of endangering species. People now wake up at 4:00 a.m. wondering whether their decaf was water-processed. We have been told to stop eating beef and start eating fish, but also watch out for mercury poisoning. . . . Losing weight itself is just a matter of cutting down on calories, except that cutting down on calories slows down the metabolism that burns the calories. Cheese, by the way, is high in calcium but also high in fat. . . . aerobics trims the waist line and wrecks the knees. They way I read it", she says, "what's good for the bones is probably bad for the arteries. What's good for the heart is probably bad for the back. And just reading this news raises everyone's stress levels. . . . . Something new comes out every week." She says that in all this specialized research, there's got to be a compromise: ". . . moderation, something between the lifestyle of a couch potato and a marathoner. But somewhere out there (you can

count on it), there is a researcher deep in a lab about to prove conclusively that moderation is absolutely hazardous to your health".

There is an awful lot out there -- and sometimes it's confusing. The key is simplicity. It's a matter of getting back to the "basics".

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Table 1

Hogeye Race Participants

(N = 47 Women)

Average Age: 33 (23-51)

Average Years Running: 6

Average Weekly Mileage: 20+ Miles

Average Training Days/Week: 4-5

Average Miles per Workout: 4-5

Average Daily Calories: 1900

(Range: 1000-4500)

Table 2

Fat = 9 Calories per Gram

Protein = 4 Calories per Gram

Carbohydrate = 4 Calories per Gram

	CALS	FAT_GRAMS
Chicken Enchiladas	360	16

16 Grams X 9 Calories = 144 Calories

Fat Cals / Total Cals =

144 / 360 =

40% Fat Content